

ad cont. presented in FIG. 3B wherein  $p_1$ ,  $p_2$ ,  $p_3$  are the three fiducial bar points of intersection with the image plane 115. The orientation of the image plane 115 relative to the fiducial motif 214 is described by three parameters by  $f$ , the fraction of the distance along the diagonal fiducial where the intersection occurs;  $\phi$ , the angle between the fiducial motif plane 214 and the image plane 115; and  $\theta$ , the angle between the parallel fiducial bars and the line of intersection.

IN THE CLAIMS

**Amend** claims 4-8, 10-11, 13-15, 19-21, 24, 26-33, 35 and 37-39 to read as follows:

4. (AMENDED) The system of claim 1 wherein the instrument pose is directly manipulated in reference to the medical image.
- 95 5. (AMENDED) The system of claim 1 wherein the relative position and orientation of the medical instrument and target site of the patient can be determined from the information contained in a single cross-sectional image produced by the imaging apparatus.
6. (AMENDED) The system of claim 1 wherein the system comprises a control apparatus that can register the instrument in a detected image space and calculate instrument movement.
7. (AMENDED) The system of claim 6 wherein the control apparatus calculates the instrument pose in the image space by generating at least three corresponding points.
8. (AMENDED) The system of claim 1 wherein the fiducial object comprises three N-shaped fiducial motifs, and the three N-shaped fiducial motifs are non-coplanar.

10. (AMENDED) The system of claim 1 wherein the medical instrument is manipulated manually.

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132 11. (AMENDED) The system of any one of claims 1 through 10 wherein the system further comprises a robotic apparatus capable of positioning the apparatus.

13. (AMENDED) The system of claim 1 wherein the imaging device is a CT, MRI or ultrasound device.

a7 14. (AMENDED) The system of claim 1 wherein the fiducial object is affixed to the instrument.

15. (AMENDED) The system of claim 14 wherein the fiducial object is integral to the instrument.

19. (AMENDED) The method of claim 16 wherein the instrument is manipulated substantially contemporaneously with respect to obtaining the image.

a8 20. (AMENDED) The method of claim 16 wherein the instrument is manipulated based on a single image.

21. (AMENDED) The method of claim 16 wherein a plurality of images are obtained.

a9 24. (AMENDED) The method of claim 16 wherein a material is deposited or administered to the patient by the instrument.

a10 26. (AMENDED) The method of claim 16 wherein energy is administered to the patient.

27. (AMENDED) The method of claim 16 wherein energy is removed from the patient.

28. (AMENDED) The method of claim 16 wherein tissue is removed from the patient by the instrument.

29. (AMENDED) The method of claim 16 wherein the instrument administers to the patient a radiation seed implant, a DNA therapeutic, a chemotherapeutic agent, a cryotherapeutic treatment, a sclerotic solution, ethanol, high intensity ultrasound, directed beam therapy, localized X-ray therapy, photodynamic therapy, laser ablation therapy, or RF ablation therapy.

30. (AMENDED) The method of claim 16 wherein the fiducial object representation in the image is unique for the pose of the instrument.

31. (AMENDED) The method of claim 16 wherein the image can produce three identifiable points to coordinate pose of the instrument and the targeted site of the patient.

32. (AMENDED) The method of claim 16 wherein the instrument pose is directly manipulated in reference to the medical image.

33. (AMENDED) The method of claim 16 wherein the instrument is registered in detected image space by a control apparatus.

35. (AMENDED) The method of claim 16 wherein the fiducial object comprises three N-shaped fiducial motifs, and the three fiducial motifs are non-coplanar.

37. (AMENDED) The method of claim 16 wherein the medical instrument is manipulated manually.